

METHOD AND APPARATUS IN A SPRAYING APPARATUS**Background of the invention**

5 The present invention relates to a method as defined in the preamble of claim 1 in a spraying apparatus, especially a spraying apparatus intended for the humidification of intake air, said apparatus comprising at least one spraying nozzle for spraying a liquid and/or gas into the intake air.

10

The invention also relates to an apparatus as defined in the preamble of claim 5. *HA*

2/14/08

15

The exhaust gases of piston engines, in particular diesel engines, contain many kinds of noxious combustion products. At the high combustion temperatures, the combustion process in the cylinder of a piston engine produces nitrogen oxides (NOx), which are emitted together with the exhaust gases into the atmosphere. Because of the negative environmental effects of nitrogen oxide emissions, efforts are undertaken to

20

minimize their production.

As is known, adding water to the combustion process reduces the generation of nitrogen oxides. This phenomenon is based on the cooling effect of water. In practice, the introduction of water into the combustion process in a piston engine is often implemented by injecting water into the intake air. These arrangements are advantageous in respect of the shaft efficiency of the engine. The maximum amount of water introduced into the combustion space of the engine may be that amount which will remain in gaseous form in the intake air pressure and temperature conditions. Clogging of the nozzles feeding water into the intake air is very undesirable because it has an effect of reducing the amount of water injected and thus increasing the amount of nitrogen oxides emitted into the environment. Disturbances in the apparatus humidifying the intake air lead to an increase of nitrogen oxide emissions. Maintaining the nozzles of the spraying apparatus, even when the humidification function performed by them is interrupted, is very impor-

30
35

tant. The conditions prevailing in the air intake duct promote clogging of the nozzles.

5 The object of the present invention is to achieve a completely new type of method in connection with a spraying apparatus that makes it possible to maintain the nozzles in working order.

Another object of the invention is to achieve a spraying apparatus in which the nozzles are preserved in working order.

10

The method of the invention is characterized in that, after the supply of the liquid and/or gas to be sprayed to the nozzle has been interrupted, a second medium, such as a liquid and/or gas, is supplied to the nozzle to prevent clogging of the nozzle.

15

The method of the invention is additionally characterized by what is stated in claims ~~2-5~~. 2-3

HA
2/14/08

20

The apparatus of the invention is characterized by what is stated in claims ~~6-10~~. 4-5

HA
2/14/08

25

The solution of the invention has numerous significant advantages. By supplying a pressure medium into the nozzles even when they are not in active use, their clogging is avoided. At the same time, malfunctions caused by the nozzles of the spraying apparatus are minimized. The increase of nitrogen oxide emissions due to equipment disturbances is thus avoided.

Brief description of the drawings

30

In the following, the invention will be described in detail by the aid of an example with reference to the attached drawing, wherein

35

Fig. 1 represents an apparatus according to the invention.